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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/519,330	03/06/2000	Radislav Alexandrovich Potyrailo	RD-27,768	8826

7590 10/03/2003  
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EXAMINER

COLE, MONIQUE T

ART UNIT PAPER NUMBER

1743

DATE MAILED: 10/03/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/519,330	POTYRAILO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Monique T. Cole	1743	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on 03 July 2003.

2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1-45 is/are pending in the application.

4a) Of the above claim(s) 22-36 is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-6, 10-21 and 37-45 is/are rejected.

7) ☒ Claim(s) 7-9 is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All   b) ☐ Some \* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_

4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 20 recites the limitation "said inert carrier gas" in line 2. There is insufficient antecedent basis for this limitation in the claim. Claim 1 does not require an inert carrier gas. It is thought that this claim should depend on claim 13.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 4, 5, 12-20, 37, 38, 39, 40, 41, 43 & 45 are rejected under 35 U.S.C. 102(b) as being anticipated by USP 5,801,297 to Misfud et al. (herein referred to as "Misfud").

Misfud teaches detection of volatile substances that comprises transporting volatile substances into an enclosure measuring electrical/piezoelectrical properties of carrier gas comprising volatile substances in order to obtain qualitative and quantitative data on said volatile substances (col. 2, lines 47-57). The sensor elements may be a plurality of semiconductive gas sensors, conductive polymer gas sensors, or surface-acoustic wave gas sensors (col. 2, lines 30-

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40). The measurements on the sensors are taken in a continuous fashion during an interval of time determined by the operator, such measurements including the rate of humidity of the flow of gas (col. 8, lines 13-20 and col. 7, line 9). The carrier gas can be purified air (inert gas) which is controlled by a variable flow rate pump used in order to establish variable controlled flow of gas during the testing & the cleaning of the detection means (col. 3, lines 4-10). The regulatable flow of gas will advantageously be variable between 5 ml/mn and 500 ml/mn (col. 5, lines 65-66). A data processing unit 16 receives the qualitative and quantitative data on the different detected and measured substances, which are transmitted to it by the measurement electronics 15. The data processing system 16 comprises a central unit provided with software application programs, and a monitor that interfaces between said central unit and the operator (col. 7, line 66-col. 8, line 6).

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims ~~2, 6, 10, 11, 21, 42 & 44~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Misfud as applied to claims 1, 3, 4, 5, 12-20, 37, 38, 39, 40, 41, 43 & 45 above, and further in view of USP 6,534,319 to Liu (herein referred to as "Liu").

Regarding claims 6, 21 & 42, Misfud fails to teach that the piezoelectric property is applied to a quartz crystal or that the sensor coating is an amorphous fluoropolymer.

Liu teaches a method of detecting volatile organic compounds using an improved sensor. The chemical sensor utilizes a piezoelectric effect wherein a quartz crystal is coated with a copolymer of perfluoro-2,2-dimethyl-1,3-dioxole & tetrafluoroethylene (col. 2, lines 62-67; col. 5, line 66-col. 6, line 15). An improved chemical detector may be constructed that has a greater ability to discriminate between sample emissions, wider applications, faster response to volatile compounds and improved stability & lifetime of the sensor (col. 5, lines 48-52; col. 6, line 59-col. 7, line 1).

Thus, given the many noted benefits of using a piezoelectric quartz crystal combined with a copolymer of perfluoro-2,2-dimethyl-1,3-dioxole & tetrafluoroethylene to detect volatile organic compounds as taught in Liu, it would have been obvious to one having ordinary skill to modify the detection method of Misfud by including a quartz crystal coated with a copolymer of perfluoro-2,2-dimethyl-1,3-dioxole & tetrafluoroethylene to measure the piezoelectrical properties of the carrier gas. By so doing, one could improve the functionality of Misfud's sensor in the ways noted by Liu.

With regard to claims 2 & 44, Misfud does not teach the presence of an optical sensor element.

However, Liu teaches the functional equivalence of quartz crystal microbalance sensors, SAW devices, acoustic plate mode devices, flexural plate wave devices and fiber optic sensors for their ability to be responsive to a particular analyte or fugitive emission being monitored (col. 4, lines 19-28). As such, given this teaching of functional equivalency by Liu, it would have been obvious to one having ordinary skill to exchange the piezoelectric device or SAW device in Misfud with a fiber optic sensor with the expectation that the device would be suitable to respond to the presence of various substances present in the sample stream.

#### *Allowable Subject Matter*

8. Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or suggest coating a sensor element for rapidly screening volatile substances in a sample according to claim 1 where the coating is a hard-soft block elastomer.

#### *Response to Arguments*

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

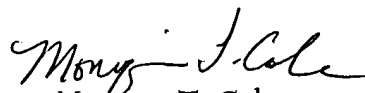
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique T. Cole whose telephone number is 703-305-0447.

The examiner can normally be reached on Monday-Thursday from 6:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 703-308-4037. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0661.



Monique T. Cole

Examiner

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